[0015] The ALPC 22 controls the power of a laser beam emitted from the pickup 21, and the radio frequency-amplifying unit 23 amplifies a minute signal picked up from the disc 20. The data processor 24 processes link data in accordance with data types, performs detection, insertion, protection, modulation and demodulation of a synchronization signal, and generates various control signals for error correction and for controlling the radio frequency-amplifying unit 23. The host interface 25 connects the optical recording apparatus with a host 26. The servo processor 27 controls various motors and servos related to the disc 20 to perform tracking and focusing, etc. The motor and driver 28 performs a function of rotating the disc 20 and driving motors, and the MICOM 29 controls the overall operation of the optical recording apparatus.

[0016] FIG. 3 is a flow chart showing the method of overwriting data in a linking loss area according to the present invention. The method has the operations of determining whether or not the first sector of a starting block (a target block), in which user data is desired to be recorded, is a linking loss area (operation 30), recording user data in blocks starting from the target block (operation 31), determining whether or not recording data is completed in N blocks (operation 32), reading the previous block (operation 33), determining whether or not reading the previous block is completed (operation 34), modifying the data type of the last sector of the previous block to '0' (operation 35), starting to record user data in blocks starting from the previous block (operation 36), and determining whether or not recording data is completed in N+1 blocks (operation 37). The host 26 generates commands for all operations. It is assumed in the present invention that user data is recorded in N ECC blocks.

[0017] The sequence of these operations will now be described as follows. To record user data on the disc 20, the host 26 determines whether or not the first sector of a starting block (a target block), in which user data is desired to be recorded, is a linking loss area in operation 30.

[0018] If it is assumed that the target block is ECC block 2 of FIG. 5, the host 26, having information on a linking loss area, performs the determination of whether or not the first sector of ECC block 2 is a linking loss area.

[0019] If the first sector of a starting block (the target block), in which user data is desired to be recorded, is not a linking loss area, user data is recorded in blocks starting from the target block, as provided in operation 31.

[0020] Recording is stopped when user data is recorded in N ECC blocks, as illustrated in operation 32.

[0021] If the first sector of a starting block (the target block), in which user data is desired to be recorded, is a linking loss area, the previous block is read, as illustrated in operation 33. If the last sector of ECC block 1 is set to '1', the first sector of the following ECC block 2 is regarded as a linking loss area when data is reproduced, and therefore ECC errors increase. To solve this problem, first, the ECC block 1 is read.

[0022] If reading the previous block, that is, the ECC block 1, is completed (operation 34), the data type of the last sector of the ECC block 1 is modified from '1b' to '0b', as illustrated in operations 34 and 35. When data is reproduced, the recording and/or reproducing apparatus determines whether or not the next sector, that is, the first sector of ECC block 2, is a linking loss area, according to the data type bit information of the last sector of ECC block 1. If the data type of the last sector of ECC block 1 is modified from '1b' to '0b', the recording and/or reproducing apparatus does not regard the first sector of the ECC block 2 as a linking loss area when data is reproduced.

[0023] Therefore, the data type of the last sector of ECC block 1 is modified to '0b' and data read from ECC block 1 is recorded in ECC block 1 in operation 36. User data is continuously recorded in the ECC blocks 1 and 2 without linking. Then, when data is reproduced, linking data in the first sector of the ECC block 2 is regarded as re-recordable data to prevent errors.

[0024] If recording data is completed in N+1 blocks, recording is finished, as illustrated in operation 37. If the first sector of a target block is a linking loss area, data is recorded in blocks starting from the previous block, and therefore data is recorded in N+1 blocks.

[0025] To help understanding the present invention, FIG. 4 shows the structure of a data identification area including a data type field. The data type field is used in decoding in the recording and/or reproducing apparatus.

[0026] The data identification area shown in FIG. 4 is formed with a sector information field and a sector number field. The sector information field is formed by a sector format type field, a tracking method field, a reflectance field, a reserve field, an area type field, a data type field and a number-of-layers field.

[0027] That is, sector format type information of bit position b31 indicates a constant linear velocity (CLV) or zone constant linear velocity (ZCLV) as follows:

0b: CLV format type

1b: Zoned format type, specified for Rewritable discs

[0028] Tracking method information of bit position b30 indicates pit tracking or groove tracking as follows:

0b: Pit tracking

1b: Groove tracking, specified for Rewritable discs

[0029] Reflectance information of bit position b29 indicates whether or not reflectance exceeds 40% as follows:

0b: Reflectance is greater than 40%

1b: Reflectance is less than or equal to 40%.

Bit position b28 indicates a reserve bit.

[0030] Area type information of bit positions b27 and b26 indicates a data area, a lead-in area, a lead-out area, or a middle area for a read-only disc as follows:

00b: Data area

01b: Lead-in area

10b: Lead-out area

11b: Middle area of read-only discs

[0031] Data type information of bit position b25 indicates read-only data, or the linking data as follows:

0b: Read-only data

1b: Linking data